

Theoretical Explanations of the Distribution of Southern Faunas.
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After reviewing the various theories which have been offered to explain the difficult and intricate problem of the distribution of southern faunas, the author points out that the supposition that the ancestors of certain groups migrated from the northern into the southern hemisphere by the present continents, and have since then become extinct in the north, explains a good deal, but fails to give a full and satisfactory explanation of the whole of the facts. Moreover, the members of the fauna unaccounted for are old forms, and consequently the means of communication which served them must long ago have been destroyed. To the author a fatal objection to the theory of migration by way of an Antarctic continent is offered by the following consideration. Aplacental Mammals—both Multituberculata and Polyprotodontia—existed in Europe and North America in the Triassic and Jurassic periods, and these Polyprotodontia were, no doubt, the ancestors of the living Polyprotodontia of Australia. In the Eocene strata of Patagonia remains of a large number of Polyprotodontia have been found which are far more closely related to the Polyprotodontia of Australia than to the Mesozoic forms of Europe and North America; consequently a direct land communication must have existed between these two southern countries. Now there is strong geological and palæontological evidence that no land-ridge existed between North and South America during the Mesozoic and early Cainozoic eras; consequently we must assume that the southern forms migrated through the Malay Archipelago, and, if they went to Patagonia by means of an Antarctic continent, they must have passed through Australia. But mingled with the Eocene marsupials of Patagonia there are a number of Eutheria of typically South-American character—Edentata, Toxodontia, Typotheria, Perissodactyla, Rodentia, and even Platyrrhine monkeys—without any northern forms of Artiodactyla, Carnivora, or Insectivora; and it is hardly possible that these should have passed through Australia without leaving any record behind. The theory of the former existence of a South Pacific Mesozoic continent, first suggested by Huxley, seems to be the only theory left. It not only explains the origin of the Australian and South-American marsupials, but also the almost simultaneous appearance of different Eutherian mammals in North and South America. We must suppose that this continent threw off first New Zealand, then Australia, then Chili, and finally disappeared under the waves. At a later date New Zealand must have formed part of a large island joined to New Caledonia, but not to Australia. The objections to this theory are geological rather than biological, involving the doctrine of the persistence of continental and oceanic areas upon which geologists are not agreed; and such objections are equally applicable to the theory of an Antarctic continent.—*Linn. Soc. New South Wales, Abstract of Proceedings*, April 29, 1896, pp. ii, iii.